Proposed Re-evaluation Decision PRVD2016-14

Copper Pesticides Environmental Assessment of Wood Preservative, Material Preservative and Antifouling Uses

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Table of Contents

Overview 1
What Is the Proposed Re-evaluation Decision 1
What Does Health Canada Consider When Making a Re-evaluation Decision? 2
What Are Copper-Containing Pesticides? 2
Environmental Considerations 2
What Happens When Copper Is Introduced Into the Environment? 2
What Additional Scientific Information is Required? 3
Next Steps 3
Science Evaluation 5
1.0 Introduction 5
2.0 Use Description of Copper-Containing pesticides 5
3.0 The Technical Grade Active Ingredients and Their Properties 5
3.1 Identity of the Technical Grade Active Ingredients 5
3.2 Physical and Chemical Properties of the Technical Grade Active Ingredients 6
4.0 Human Health 6
5.0 Environment 6
5.1 Environmental fate 6
5.2 Environmental Exposure and Risk Assessment 7
6.0 Value 8
7.0 Pest Control Product Policy Considerations 8
8.0 Incident reports 8
9.0 Organisation for Economic Co-operation and Development Status 8
10.0 Proposed Re-evaluation Decision 9
11.0 Supporting Documentation 9
List of Abbreviations 11
Appendix I Registered Cuprous Oxide, Copper Hydroxide, Metallic Copper and Copper Present As Mixed Copper Ethanolamine Complexes Products with Antifouling, Wood Preservative and/or Material Preservative Uses, as of 20 October 2015 13
Appendix II Label Amendments for Copper Products Containing Cuprous Oxide, Copper Hydroxide, Metallic Copper and Copper Present as Mixed Copper Ethanolamine Complexes 19
References 23

Overview

What Is the Proposed Re-evaluation Decision?

After the final phase of re-evaluation of the copper pesticides, Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act* and Regulations, is proposing continued registration of products containing cuprous oxide, copper hydroxide, metallic copper and copper present as mixed copper ethanolamine complexes, for sale and use in Canada.

Health Canada's PMRA considered a phased approach for the re-evaluation of copper pesticides first registered before 1995. The first phase assessed risks to human health from all registered uses in Canada, and on the risks to the environment from agricultural, forestry, direct aquatic (including swimming pools) and industrial uses (Canada, 2009; Canada, 2010). At the time, it was noted that risks to the environment from the antimicrobial uses (wood preservative, material preservative, and antifouling uses) were to be assessed separately. The following copper-containing active ingredients, which are registered for wood preservative, material preservative, and/or antifouling uses, are included in the current review: cuprous oxide, copper hydroxide, metallic copper and copper present as mixed copper ethanolamine complexes. This second and final phase of the re-evaluation assesses risks to the environment from these antimicrobial uses.

Products containing copper-based active ingredients that are registered for wood preservative, material preservative or antifouling uses, do not present unacceptable risks to the environment when used according to the revised label directions. No additional data are being requested at this time. This proposal affects all end-use products containing cuprous oxide, copper hydroxide, metallic copper and copper present as mixed copper ethanolamine complexes registered in Canada.

This Proposed Re-evaluation Decision is a consultation document[1] that summarizes the science evaluation for copper-containing pesticides and presents the reasons for the proposed re-evaluation decision.

The information is presented in two parts. The Overview describes the regulatory process and key points of the evaluation, while the Science Evaluation provides detailed technical information on the environmental assessment of the copper-based active ingredients registered for wood preservative, material preservative and antifouling uses.

The PMRA will accept written comments on this proposal up to 45 days from the date of publication of this document. Please forward all comments to Publications (please see contact information indicated on the cover page of this document).

[1] "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*.

What Does Health Canada Consider When Making a Re-evaluation Decision?

The PMRA's pesticide re-evaluation program considers potential risks, as well as value, of pesticide products to ensure they meet modern standards established to protect human health and the environment. The copper-containing pesticides were re-evaluated under Re-evaluation Program 1 as per Regulatory Directive DIR2001-03, *Pest Management Regulatory Agency Re-evaluation Program*. This program relies as much as possible on foreign reviews, typically United States Environmental Protection Agency (USEPA) Reregistration Eligibility Decision (RED) documents. For products to be re-evaluated under Program 1, the foreign review must meet the following conditions:

- it covers the main science areas, such as human health and the environment, that are necessary for Canadian re-evaluation decisions;
- it addresses the active ingredient and the main formulation types registered in Canada; and
- it is relevant to registered Canadian uses.

In this decision, the PMRA takes into account the Canadian use pattern and issues (for example, the federal Toxic Substances Management Policy [TSMP]).

The USEPA re-evaluated copper-containing pesticides and published its conclusions in a 2006 RED and a 2009 Revised RED for coppers. At the time, an ecological assessment of antimicrobial uses was not included. In August 2010, the USEPA published an Addendum to the 2009 Revised RED, which included environmental assessments for antifouling, wood and material preservative uses of copper pesticides. Based on its assessment, the USEPA concluded that copper-containing pesticides were eligible for reregistration. The PMRA compared the American and Canadian use patterns and determined the USEPA assessments were an adequate basis for the proposed Canadian re-evaluation decision.

For more details on the information presented in this overview, please refer to the Science Evaluation of this consultation document.

What Are Copper-Containing Pesticides?

Copper-containing pesticides are formulated using various forms of copper, which ultimately dissociate into cupric ion complexes and compounds, including the cupric ion (Cu^{2+}), the active component. A complete description of the copper-containing active ingredients was previously described in the first phase of re-evaluation (Canada, 2009).

Environmental Considerations

What Happens When Copper Is Introduced Into the Environment?

Copper, from wood preservative, material preservative or antifouling uses, is unlikely to affect non-target organisms when used according to the revised label directions.

A complete evaluation of copper's environmental fate and toxicity is available in Proposed Re-evaluation Decision PRVD2009-04, *Copper Pesticides* (Canada, 2009).

The USEPA concluded that the reregistration of antimicrobial uses of copper-containing pesticides was acceptable. Environmental exposures and risks from wood preservative, material preservative, or antifouling uses are within the range of those identified from the agricultural scenarios previously assessed. No mitigation measures were required by the USEPA. These conclusions apply to the Canadian situation. To minimize the potential exposure to non-target organisms, standard environmental hazard and advisory label statements are proposed to be added to all product labels.

What Additional Scientific Information is Required?

No additional data are required.

Next Steps

Before making a final re-evaluation decision on cuprous oxide, copper hydroxide, metallic copper and copper present as mixed copper ethanolamine complexes, the PMRA will consider all comments received from the public in response to this consultation document. A science-based approach will be applied in making a final decision on the copper pesticides. The PMRA will then publish a Re-evaluation Decision[2] that will include the decision, the reasons for it, a summary of comments received on the proposed decision and the PMRA's response to these comments.

[2] "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act*.

Science Evaluation

1.0 Introduction

The PMRA used assessments of coppers from the United States Environmental Protection (USEPA). The USEPA revised Reregistration Eligibility Decision (RED) documents for coppers, dated May 2009, and the Revised Addendum to the 2009 Revised RED, dated August 2010, as well as other information on the regulatory status of copper compounds in the United States can be found at www.regulations.gov (Docket Number EPA-HQ-OPP-2005-0558).

2.0 Use Description of Copper-Containing Pesticides

Cuprous oxide, copper hydroxide, metallic copper and copper present as mixed ethanolamine complexes are registered in Canada as wood preservatives (heavy-duty and remedial), material preservatives (shingles and non-food contact touch surfaces) and/or antifouling coatings (for example, boat/ship hulls/bottoms and aquaculture equipment). The products are registered as Commercial or Domestic class.

The American and Canadian use patterns were compared. End-use products in the United States have similar formulation types, guarantees, use sites and application methods as those in Canada. In addition, application rates in the United States are either similar or higher than those in Canada. Based on this comparison of use patterns, it was concluded that the USEPA assessment for coppers is an adequate basis for the re-evaluation of copper-containing pesticides in Canada.

All current uses are being supported by the registrants and were, therefore, considered in the re-evaluation. Appendix I lists all cuprous oxide, copper hydroxide, metallic copper and copper present as mixed ethanolamine complexes products that are registered for wood preservative, material preservative and/or antifouling uses, as of 20 October 2015 under the authority of the *Pest Control Products Act*.

3.0 The Technical Grade Active Ingredients and their Properties

Based on a review of the available chemistry information, impurities of human health or environmental concern as identified in the *Canada Gazette*, Part II, Vol. 142, No. 13, SI/2008-67 (2008-06-25), including TSMP Track 1 substances, are not expected to be present in the technical products. The identity and properties of the technical grade active ingredients are presented below.

3.1 Identity of the Technical Grade Active Ingredients

Chemical Name	Common Name	CAS #	Molecular Formula	Molecular Weight	Percent Copper in Products
Copper(I) oxide (IUPAC)	Cuprous oxide	1317-39-1	Cu_2O	143.1	87– 88.44
Copper(II) hydroxide (IUPAC)	Copper hydroxide	20427-59-2	$Cu(OH)_2$	97.6	32.5 – 61
Copper (IUPAC)	Metallic copper	7440-50-8	Cu	63.6	99.1 - 99.9

Chemical Name	Common Name	CAS #	Molecular Formula	Molecular Weight	Percent Copper in Products
Bis[2-(amino-.kappa.N)ethanolato-.kappa.O]copper (IUPAC)	Mixed copper ethanolamine complexes or copper(II) 2-aminoethanolate	14215-52-2	$Cu(C_2H_6NO)$	183.7	9.0

3.2 Physical and Chemical Properties of the Technical Grade Active Ingredients

Common Name	Vapour Pressure	Ultraviolet (UV)/Visible Spectrum	Solubility in Water	*n*-Octanol–Water Partition Coefficient	Dissociation Constant
Cuprous oxide	Negligible; ionic solid	Not applicable; not susceptible to photochemical degradation	Sparingly soluble	Not applicable; metal oxide	Not applicable; practically insoluble in water
Copper hydroxide	Negligible; ionic solid	Not applicable; not susceptible to photochemical degradation	0.5 mg/L (sparingly soluble)	Not applicable; metal oxide	Not applicable; practically insoluble in water
Metallic copper	Negligible; ionic solid	Not applicable; not susceptible to photochemical degradation	1 mg/L (sparingly soluble)	Not applicable	Not applicable
Mixed copper ethanolamine complexes or copper(II) 2-aminoethanolate	1.9 kPa at 20°C for the aqueous solution	Absorbs in UV/visible spectrum	Total dissolution	Not applicable; aqueous solution	Equilibrium of soluble complexes with pKa values of ~8 and ~10

4.0 Human Health

The human health evaluation of copper pesticides was previously considered in the first phase of the re-evaluation (Canada, 2009).

5.0 Environment

5.1 Environmental Fate

Copper is an element that occurs naturally in the environment and does not break down any further via hydrolysis, metabolism or any other degradation processes. The free cupric ion has a high sorption affinity for soil, sediments and organic matter, and copper applied to the soil surface is not expected to move readily into groundwater. The copper ion is highly reactive, especially in aquatic environments. The form in which copper is found depends on water chemistry, such as the pH or organic content. Bioaccumulation of copper from the environment occurs if the copper is biologically available; however, many organisms are capable of regulating their body copper concentration. For more details, please refer to Proposed Re-evaluation Decision PRVD2009-04, *Copper Pesticides* (Canada, 2009).

5.2 Environmental Exposure and Risk Assessment

Based on the Canadian uses of copper as a wood preservative, material preservative and/or antifouling paint/coating, exposure and risk to terrestrial organisms is expected to be limited.

Aquatic organisms may be exposed if copper is released from treated materials and enters surface water either directly or through runoff. The toxicity of copper to aquatic organisms depends on the amount of bioavailable cupric ion in the water and is largely a function of water chemistry. The main cause of copper toxicity to aquatic organisms is through rapid binding to the gill membranes, which causes damage and interferes with osmoregulatory processes. Aquatic plants are more sensitive to copper than terrestrial plants. Given the limited environmental exposure data available (for example, leaching data), the USEPA conducted highly conservative ecological assessments for the most representative uses.

The wood preservative and material preservative uses were represented by preserved wood (decks and fencing) and industrial coatings (algae-resistant roofing shingles) in a housing community. Estimated environmental concentrations (EECs) and predicted LC_{50} values were generated using the Biotic Ligand Model (BLM) and water chemistry data from 811 United States Geological Survey (USGS) monitoring sites. The BLM, essentially a combined speciation and toxicity model, allows the calculation of toxicity values based on site-specific water chemistry. The most sensitive aquatic species were daphnids and salmonoids. This approach was also used to assess ecological risks from agricultural uses (Canada, 2009). Exposure estimates were based on the conservative assumptions that there were four houses per acre and that each of these homes had copper-treated shingles, or copper-treated wood decks and copper-treated wood fences. In the absence of leaching and other environmental fate data, it was assumed that 100% of copper leached from the treated structures would reach water bodies. Risk quotients (RQs) were calculated based on the predicted values and compared to the level of concern (LOC). For the roofing shingle uses, less than 1% of sites resulted in RQs higher than the LOC of 1. For wood preservative uses, 18% of sites resulted in RQs higher than the LOC of 1. However, given these conservative assumptions, it was determined that the scenarios did not reflect real-life conditions in which copper products are used. Consequently, the generated concentrations were considered to overestimate the potential levels of copper in the environment and the associated risk estimates. No mitigation measures were required by the USEPA.

The antifouling uses were represented by copper-based antifoulant paints applied to ships and other recreational water vehicles in a commercial marina. EECs were generated using the Marine Antifoulant Model to Predict Environmental Concentrations (MAM-PEC Model, version 2). The model predicts concentrations of copper in the water using physical and chemical characteristics of copper, including leaching rate. The most sensitive species were freshwater green algae and daphnia, and the marine mussel (Canada, 2009). Exposure estimates were based on the conservative assumptions that 100% of ships were treated with copper (total load of 245 kg/day), and that copper would leach at the highest possible rate (50 $\mu g/cm^2/day$). Based on the maximum predicted dissolved copper concentration in a commercial marina, RQs exceeded the LOC of 1 for freshwater species ($RQs < 2$) but not for marine species (< 1). It was concluded that based on the conservative assumptions, the MAM-PEC model may overestimate the potential levels of copper in the environment. Further, based on environmental fate characteristics of copper (free cupric ion is highly reactive in aquatic environments and binds tightly to sediment and organic

matter), risks to aquatic organisms from antifouling uses are not expected to be of concern. No mitigation measures were required by the USEPA.

Overall, the USEPA concluded that environmental exposures and risks from wood preservative, material preservative and/or antifouling uses are not of concern, and are within the range of those associated with agricultural uses. Based on the similarity of use patterns between Canada and the United States, the USEPA conclusions with respect to the environment are considered applicable to the uses of copper-containing pesticides in Canada. Based on the available acute toxicity data, an advisory label statement regarding copper's potential toxicity to non-target aquatic organisms is proposed on end-use product labels. To maintain consistency, it is also proposed to update end-use product labels based on PMRA's current environmental labelling standards (Appendix II).

6.0 Value

The value of copper pesticides was previously considered in the first phase of the re-evaluation (Canada, 2009).

7.0 Pest Control Product Policy Considerations

Pest Control Product Policy Considerations, such as the Toxic Substances Management Policy (TSMP) as well as formulants and contaminants of health or environmental concern, have previously been considered during the first phase of the copper pesticides re-evaluation (Canada, 2009). Copper does not meet all Track 1 criteria, and is not considered a Track 1 substance. Technical products of copper are not expected to contain any contaminants of health of environmental concern identified in the *Canada Gazette*.

8.0 Incident reports

Since 26 April 2007, registrants have been required by law to report incidents, including adverse effects to health and the environment, to the PMRA. Information on the reporting of incidents can be found on the Pesticides and Pest Management portion of Health Canada's website.

As of 5 November 2015, no incidents related to environmental exposure from antimicrobial uses of copper pesticides were submitted to the PMRA.

9.0 Organisation for Economic Co-operation and Development Status

Canada is part of the Organisation for Economic Co-operation and Development (OECD), which provides a forum in which governments can work together to share experience and seek solutions to common problems.

As part of the re-evaluation of an active ingredient, the PMRA takes into consideration recent developments and new information on the status of an active ingredient in other jurisdictions, including OECD member countries. In particular, decisions by an OECD member country to prohibit all uses of an active ingredient for health or environmental reasons are considered for relevance to the Canadian situation.

Copper oxide, copper hydroxide, metallic copper and/or copper present as mixed ethanolamine complexes are currently acceptable for use in other OECD member countries, including the United States and Australia. No decision by an OECD member country to prohibit all uses of one or more of these copper active ingredients for health or environmental reasons has been identified.

10.0 Proposed Re-evaluation Decision

The PMRA is proposing that products containing cuprous oxide, copper hydroxide, metallic copper and copper present as mixed copper ethanolamine complexes for sale and use as antifoulants, wood preservatives or material preservatives in Canada are acceptable for continued registration with the implementation of the proposed updated label statements. These statements are proposed to further protect the environment. The proposed label statements are presented in Appendix II. No additional data are being requested at this time.

11.0 Supporting Documentation

PMRA documents, such as Regulatory Directive DIR2001-03, *Pest Management Regulatory Agency Re-evaluation Program* and DACO tables (datacode tables) can be found on the Pesticides and Pest Management portion of Health Canada's website at healthcanada.gc.ca/pmra. PMRA documents are also available through the Pest Management Information Service. Phone: 1-800-267-6315 within Canada or 1-613-736-3799 outside Canada (long distance charges apply); fax: 613-736-3798; e-mail: pmra.infoserv@hc-sc.gc.ca.

The federal TSMP is available through the Environment Canada website.

The USEPA RED documents for the copper pesticides are available at www.regulations.gov (Docket Number EPA-HQ-OPP-2005-0558)

List of Abbreviations

BLM	Biotic-Ligand Model
CAS	Chemical Abstracts Service
Cu^{2+}	cupric ion
DACO	data code
EEC	estimated environmental concentration
IUPAC	International Union of Pure and Applied Chemistry
kg	kilogram(s)
K_{ow}	*n*-octanol–water partition coefficient
kPa	kilopascal
L	litre(s)
LC_{50}	lethal concentration to 50%
LOC	level of concern
mg	milligram(s)
OECD	Organisation for Economic Co-operation and Development
PCPA	*Pest Control Products Act*
pH	-log10 hydrogen ion concentration
PMRA	Pest Management Regulatory Agency
PRVD	Proposed Re-evaluation Decision
RED	Reregistration Eligibility Decision
RQ	risk quotient
RVD	Re-evaluation Decision
TGAI	technical grade active ingredient
TSMP	Toxic Substances Management Policy
USEPA	United States Environmental Protection Agency
UV	ultraviolet

Appendix I Registered Cuprous Oxide, Copper Hydroxide, Metallic Copper and Copper Present as Mixed Copper Ethanolamine Complexes Products with Antifouling, Wood Preservative and/or Material Preservative Uses, as of 20 October 2015

Cuprous Oxide						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee Cu_2O (Elemental) (%)**	**Product Type**
21241	TECHNICAL ACTIVE	AMERICAN CHEMET CORPORATION*	TECHNICAL HIGH PERFORMANCE CHEM COPP	DUST OR POWDER	88	Not applicable
21242	TECHNICAL ACTIVE	AMERICAN CHEMET CORPORATION*	TECHNICAL LOLO TINT 97	DUST OR POWDER	88	Not applicable
21243	TECHNICAL ACTIVE	AMERICAN CHEMET CORPORATION*	TECHNICAL PURPLE COPP 97N	DUST OR POWDER	88	Not applicable
21244	TECHNICAL ACTIVE	AMERICAN CHEMET CORPORATION*	RED COPP 97N TECHNICAL	DUST OR POWDER	88	Not applicable
22088	TECHNICAL ACTIVE	NORDOX INDUSTRIES A S*	NORDOX CUPROUS OXIDE POWDER	DUST OR POWDER	97.0	Not applicable
22327	TECHNICAL ACTIVE	SCM METAL PRODUCTS, INC.*	SCM METAL PRODUCTS CUPROUS OXIDE	DUST OR POWDER	88.44	Not applicable
29178	TECHNICAL ACTIVE	AMERICAN CHEMET CORPORATION*	RED PREMIUM TECHNICAL	DUST OR POWDER	88	Not applicable
21351	DOMESTIC	INTERNATIONAL PAINT LLC.*	MICRON CSC (VARIOUS COLOURS)	SUSPENSION	36 (33)	Antifouling Coating
21352	DOMESTIC	INTERNATIONAL PAINT LLC.*	MICRON CSC (SHARK WHITE)	SUSPENSION	36 (33)	Antifouling Coating
21354	DOMESTIC	INTERNATIONAL PAINT LLC.*	BOTTOMKOTE XXX (VARIOUS COLOURS)	SUSPENSION	28.15 (25)	Antifouling Coating
21355	DOMESTIC	INTERNATIONAL PAINT LLC.*	BOTTOMKOTE (VARIOUS COLOURS)	SUSPENSION	44.14 (39.2)	Antifouling Coating
22022	DOMESTIC	INTERNATIONAL PAINT LLC.*	VC-OFFSHORE (BLUE, RED, BLACK)	SUSPENSION	41.66 (37.15)	Antifouling Coating
22718	DOMESTIC	INTERNATIONAL PAINT LLC.*	C-SHIELD (RED)	SOLUTION	10.13 (9)	Antifouling Coating
22727	DOMESTIC	INTERNATIONAL PAINT LLC.*	C-SWIFT (BLUE, RED, BLACK)	SUSPENSION	38%	Antifouling Coating
22728	DOMESTIC	INTERNATIONAL PAINT LLC.*	C-UNION JACK (RED)	SUSPENSION	(17.87)	Antifouling Coating
22820	DOMESTIC	INTERNATIONAL PAINT LLC.*	UNION JACK ANTIFOULING PAINT: RED NAU662	SUSPENSION	22%	Antifouling Coating
24389	DOMESTIC	INTERNATIONAL PAINT LLC.*	AQUARIUS (VARIOUS COLOURS)	SUSPENSION	49.73 (44.17)	Antifouling Coating
24392	DOMESTIC	INTERNATIONAL PAINT LLC.*	BOTTOMKOTE HS (VARIOUS COLOURS)	SOLUTION	42.67 (37.90)	Antifouling Coating
24393	DOMESTIC	INTERNATIONAL PAINT LLC.*	MICRON CSC EXTRA (VARIOUS COLOURS)	SUSPENSION	37.04 (32.09)	Antifouling Coating
24394	DOMESTIC	INTERNATIONAL PAINT LLC.*	ULTRA-KOTE EXTRA (RED, BLUE)	SOLUTION	72.18 (64.10)	Antifouling Coating
24395	DOMESTIC	INTERNATIONAL PAINT LLC.*	ULTRA-KOTE (RED, GREEN, BLUE, BLACK, BROWN)	SOLUTION	65.71 (58.36)	Antifouling Coating
26709	DOMESTIC	INTERNATIONAL PAINT LLC.*	BOTTOMKOTE ACT (VARIOUS COLOURS)	SOLUTION	41.97	Antifouling Coating
27574	DOMESTIC	INTERNATIONAL PAINT LLC.*	VINY-LUX (BLACK, GREEN, BLUE)	SUSPENSION	33.78 (30)	Antifouling Coating
27575	DOMESTIC	INTERNATIONAL PAINT LLC.*	VINY-LUX (RED)	SUSPENSION	42.79 (38)	Antifouling Coating

Cuprous Oxide						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee Cu_2O (Elemental) (%)**	**Product Type**
21378	COMMERCIAL	INTERNATIONAL PAINT LLC.*	INTERSPEED BLA110 PREMIUM RED (ZA463003)	SUSPENSION	23.65 (21.0)	Antifouling Coating
21379	COMMERCIAL	INTERNATIONAL PAINT LLC.*	UNION JACK BCA350 COPPER RED (ZA469005)	SUSPENSION	17.86	Antifouling Coating
21397	COMMERCIAL	INTERNATIONAL PAINT LLC.*	INTERCLENE BRA542 BLACK (ZA467003) & BRA540 RED (ZA463007)	SOLUTION	38.28 (34)	Antifouling Coating
21652	COMMERCIAL	INTERNATIONAL PAINT LLC.*	EPOXYCOP	SUSPENSION	37.3	Antifouling Coating
21656	COMMERCIAL	HEMPEL (CANADA) INC.*	HEMPEL'S ANTIFOULING OLYMPIC 7660-5111 RED	SUSPENSION	45.31 (40.24)	Antifouling Coating
21657	COMMERCIAL	HEMPEL (CANADA) INC.*	HEMPEL'S ANTIFOULING OLYMPIC 7660-5030 LIGHT RED	SUSPENSION	45.31 (40.24)	Antifouling Coating
21658	COMMERCIAL	HEMPEL (CANADA) INC.*	HEMPEL'S ANTIFOULING OLYMPIC 7660-1999 BLACK	SUSPENSION	45.31 (40.24)	Antifouling Coating
21840	COMMERCIAL	INTERNATIONAL PAINT LLC.*	WEST MARINE BOTTOMSHIELD ANTIFOULING BOTTOM PAINT (VARIOUS COLOURS)	SOLUTION	42.56 (37.8)	Antifouling Coating
21841	COMMERCIAL	INTERNATIONAL PAINT LLC.*	TARR & WONSON COPPER PAINT RED 503-C	SOLUTION	25.67 (22.8)	Antifouling Coating
21986	COMMERCIAL	FLEXABAR CORP.*	FLEXGARD XI WATERBASE PRESERVATIVE	EMULSIFIABLE CONCENTRATE OR EMULSION	24.64	Antifouling Coating
22717	COMMERCIAL	INTERNATIONAL PAINT LLC.*	INTERSPEED 640 ANTIFOULING SERIES (OCEAN GREEN, RED, BLACK, BLUE)	SOLUTION	42.79 (38)	Antifouling Coating
23511	COMMERCIAL	SOCIETE LAURENTIDE INC	ATLANTIC ANTIFOULING PAINT COPPER BOTTOM RED	SUSPENSION	8.78	Antifouling Coating
23511.01	COMMERCIAL	SOCIETE LAURENTIDE INC	MATCHLESS SUPER MARINE	SUSPENSION	8.78	Antifouling Coating
23803	COMMERCIAL	FLEXABAR CORP.*	FLEXGARD VI WATERBASE PRESERVATIVE	EMULSIFIABLE CONCENTRATE OR EMULSION	14.26	Antifouling Coating
24097	COMMERCIAL	KOP-COAT INC.*	WEST MARINE CPP! PLUS ABLATIVE ANTIFOULING PAINT (BLUE, RED, BLACK, GREEN)	SUSPENSION	44.0	Antifouling Coating
24390	COMMERCIAL	INTERNATIONAL PAINT LLC.*	INTERCLENE 140 BWA 360 ANTIFOULING RED	SOLUTION	38.2 (33.93)	Antifouling Coating
24391	COMMERCIAL	INTERNATIONAL PAINT LLC.*	INTERSPEED 6200NA BQA654 ANTIFOULING RED	SOLUTION	21.73	Antifouling Coating
24409	COMMERCIAL	FLEXDEL CORP	AQUAGARD WATERBASE ANTIFOULING BOTTOM BOAT PAINT	SUSPENSION	23.6	Antifouling Coating
25788	COMMERCIAL	JOTUN PAINTS INC.	ANTIFOULING SEAFORCE 200 AV (VARIOUS COLORS)	SUSPENSION	45.53	Antifouling Coating
26589	COMMERCIAL	PPG ARCHITECTURAL FINISHES INCORPORATED*	AMERCOAT ABC #4 ANTIFOULING PAINT	SUSPENSION	27.1	Antifouling Coating
26907	COMMERCIAL	SASOL WAX GMBH*	NETREX AF MICRO CRYSTALLINE WAX	EMULSIFIABLE CONCENTRATE OR EMULSION	17	Antifouling Coating

Cuprous Oxide						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee Cu_2O (Elemental) (%)**	**Product Type**
26991	COMMERCIAL	PPG ARCHITECTURAL FINISHES INCORPORATED*	AMERCOAT ABC #3 ANTIFOULING PAINT RED	SUSPENSION	42	Antifouling Coating
27098	COMMERCIAL	INTERNATIONAL PAINT LLC.*	INTERCLENE BRA 570 ANTIFOULING SERIES	SUSPENSION	37.2 (32.9)	Antifouling Coating
27277	COMMERCIAL	KOP-COAT INC.*	HORIZONS ABLATIVE ANTIFOULING BOTTOM PAINT	SUSPENSION	44.0	Antifouling Coating
27573	COMMERCIAL	INTERNATIONAL PAINT LLC.*	123 PAINT VINYL ANTIFOULING (ZA469033)	SUSPENSION	67.6 (60)	Antifouling Coating
28046	COMMERCIAL	IKO INDUSTRIES LTD*	AR GRANULES (ALGAE-RESISTANT ROOFING GRANULES)	GRANULAR	4.07	Material Preservative
31458	COMMERCIAL	FLEXDEL CORP	AQUAGARD WATERBASE ANTIFOULING RUBBER INFLATABLE BOAT PAINT	SUSPENSION	23.6	Antifouling Coating

Copper Hydroxide						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee (Elemental) (%)**	**Product Type**
24670	TECHNICAL ACTIVE	NUFARM AGRICULTURE INC.*	CHAMPION TECHNICAL	SOLID	57.3	Not applicable
27503	TECHNICAL ACTIVE	E.I. DU PONT CANADA COMPANY*	KOCIDE COPPER HYDROXIDE TECHNICAL	SOLID	61	Not applicable
30390	TECHNICAL ACTIVE	ALBAUGH INC.*	COPPER HYDROXIDE MUP	SOLID	60.6	Not applicable
31374	TECHNICAL ACTIVE	NUFARM AGRICULTURE INC.*	CHAMPION WET CAKE TECHNICAL	SOLID	32.5	Not applicable
29255	MANUFACTURING CONCENTRATE	SEPRO CORPORATION*	SPIN OUT 260 MANUFACTURING CONCENTRATE	SUSPENSION	12.8	Not applicable
27214	DOMESTIC	GENICS INC.*	GENICS POSTGUARD	SOLID	1.71	Remedial Wood Preservative
25580	COMMERCIAL	GENICS INC.*	COBRA (TM) ROD	SOLID	1.8	Remedial Wood Preservative
27553	COMMERCIAL	GENICS INC.*	COBRA (TM) CRUSH MDT WOOD PRESERVATIVE	SOLUBLE POWDER	6.1	Wood Preservative
31806	COMMERCIAL	GENICS INC.*	COBRA WRAP GEL	PASTE	2	Remedial Wood Preservative

Metallic Copper						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee (label) (%)**	**Product Type**
27903	TECHNICAL ACTIVE	ECKART GMBH	COPPER FLAKE TECHNICAL	DUST OR POWDER	99.1	Not applicable
31171	TECHNICAL ACTIVE	CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION (CCBDA)*	COPPER TGAI	SOLID	99.98	Not applicable

Metallic Copper						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee (label) (%)**	**Product Type**
31751	TECHNICAL ACTIVE	ARCH WOOD PROTECTION CANADA CORP*	COPPER TECHNICAL FLAKE	SOLID	99.9	Not applicable
21372	DOMESTIC	INTERNATIONAL PAINT LLC.*	FIBREGLASS BOTTOMKOTE RACING BRONZE	SOLUTION	28	Antifouling Coating
22020	DOMESTIC	INTERNATIONAL PAINT LLC.*	VC 17M	SUSPENSION	20.25	Antifouling Coating
31172	COMMERCIAL	CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION (CCBDA)*	ANTIMICROBIAL COPPER ALLOYS GROUP I	SOLID	96.2	Sanitizer / Material Preservative
31173	COMMERCIAL	CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION (CCBDA)*	ANTIMICROBIAL COPPER ALLOYS GROUP II	SOLID	91.3	Sanitizer / Material Preservative
31174	COMMERCIAL	CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION (CCBDA)*	ANTIMICROBIAL COPPER ALLOYS GROUP III	SOLID	82.6	Sanitizer / Material Preservative
31175	COMMERCIAL	CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION (CCBDA)*	ANTIMICROBIAL COPPER ALLOYS GROUP IV	SOLID	73.0	Sanitizer / Material Preservative
31176	COMMERCIAL	CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION (CCBDA)*	ANTIMICROBIAL COPPER ALLOYS GROUP V	SOLID	66.5	Sanitizer / Material Preservative
31177	COMMERCIAL	CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION (CCBDA)*	ANTIMICROBIAL COPPER ALLOYS GROUP VI	SOLID	62.0	Sanitizer / Material Preservative
31963	COMMERCIAL	GLOBAL BRASS AND COPPER INC.	CUVERRO I	SOLID	66.5	Sanitizer / Material Preservative
31967	COMMERCIAL	GLOBAL BRASS AND COPPER INC.	CUVERRO III	SOLID	82.6	Sanitizer / Material Preservative
31974	COMMERCIAL	GLOBAL BRASS AND COPPER INC.	CUVERRO V	SOLID	91.3	Sanitizer / Material Preservative
31976	COMMERCIAL	GLOBAL BRASS AND COPPER INC.	CUVERRO VI	SOLID	62.0	Sanitizer / Material Preservative

Copper present as mixed copper ethanolamine complexes						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee (%)**	**Product Type**
27129	TECHNICAL ACTIVE	VIANCE LLC*	ACQ C2 TECHNICAL	SOLUTION	9	Not applicable
30771	TECHNICAL ACTIVE	TIMBER SPECIALTIES CO*	NW 100-Technical	SOLUTION	9	Not applicable
27130	COMMERCIAL	VIANCE LLC*	ACQ 2102 WOOD PRESERVATIVE CONCENTRATE	SOLUTION	7.4	Heavy Duty Wood Preservative
27131	COMMERCIAL	TIMBER SPECIALTIES CO*	NW 100 WOOD PRESERVATIVE CONCENTRATE	SOLUTION	7.4	Heavy Duty Wood Preservative
27132	COMMERCIAL	ARCH WOOD PROTECTION CANADA CORP*	WOLMAN NB	EMULSIFIABLE CONCENTRATE	9.25	Heavy Duty Wood Preservative
27621	COMMERCIAL	COPPER CARE WOOD PRESERVATIVES INC.*	CU-BOR REMEDIAL WOOD PRESERVATIVE	PASTE	2	Remedial Wood Preservative
28634	COMMERCIAL	TIMBER SPECIALTIES CO*	NW 100-C	SOLUTION	9	Heavy Duty Wood Preservative
28635	COMMERCIAL	VIANCE LLC*	ACQ-C2 EU	SOLUTION	9	Heavy Duty Wood

Copper present as mixed copper ethanolamine complexes						
Registration Number	**Marketing Class**	**Registrant**	**Product Name**	**Formulation Type**	**Guarantee (%)**	**Product Type**
						Preservative
31020	COMMERCIAL	VIANCE LLC*	ACQ 1900 WOOD PRESERVATIVE CONCENTRATE	SOLUTION	7.4	Heavy Duty Wood Preservative
31160	COMMERCIAL	VIANCE LLC*	VIANCE CA-B	EMULSIFIABLE CONCENTRATE	9.25	Heavy Duty Wood Preservative

Appendix II Label Amendments for Copper Products Containing Cuprous Oxide, Copper Hydroxide, Metallic Copper and Copper Present as Mixed Copper Ethanolamine Complexes

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Information on labels of currently registered products should not be removed unless it contradicts the above label statements.

A submission to request label revisions will be required within 90 days of finalization of the re-evaluation decision.

DOMESTIC END-USE PRODUCT LABELS

The labels of domestic class end-use products registered for use as antifoulants or remedial wood preservatives in Canada must be amended to include the following statements to further protect the environment.

A. For products registered for use as antifouling paints/coatings:

I) The following statement must be included in a section entitled **DIRECTIONS FOR USE**:

> It is recommended that you prevent paint chips or dust caused by removing paint from entering water. **DO NOT** place the painted parts in water after painting until the paint is fully cured (see recommended times on the label).

II) The following statement must be included in a section entitled **ENVIRONMENTAL HAZARDS**.

> Toxic to aquatic organisms.

B. For products registered for use as remedial wood preservatives:

I) The following statement must be included in a section entitled **DIRECTIONS FOR USE**:

> **DO NOT** apply this product to wood that will be used in water.

II) The following statement must be included in a section entitled **ENVIRONMENTAL HAZARDS**:

> Toxic to aquatic organisms.

COMMERCIAL END-USE PRODUCT LABELS

The labels of commercial class end-use products registered for use as antifoulants, wood preservatives or material preservatives in Canada must be amended to include the following statements to further protect workers and the environment.

A. For all products:

I) The following statements must be included in a section entitled **DIRECTIONS FOR USE**:

> **DO NOT** contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.
>
> **DO NOT** apply this product directly to freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands), or estuarine/marine habitats.
>
> **DO NOT** discharge effluent containing this product or the biocide produced into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters unless the effluent has been detoxified by suitable means.

II) The following statement must be included in a section entitled **ENVIRONMENTAL HAZARDS**:

> Toxic to aquatic organisms.

II) The following statement must be included in a section entitled **DISPOSAL**:

Canadian manufacturers should dispose of unwanted active ingredients and containers in accordance with municipal or provincial regulations. For additional details and clean up of spills, contact the manufacturer or the provincial regulatory agency.

B. For products registered for use as antifouling paints/coatings:

I) The following statement must be included in a section entitled **DIRECTIONS FOR USE**:

> It is recommended that you prevent paint chips or dust caused by removing paint from entering water. **DO NOT** place the painted parts in water after painting until the paint is fully cured (see recommended times on the label).

C. For products registered for use as heavy-duty wood preservatives:

I) The following statements must be included in a section entitled **DIRECTIONS FOR USE**:

Store treated lumber on a roofed drip pad until dripping has ceased. Slope lumber on the drip pad to expedite drainage and to ensure that no puddles remain on the surface of the wood. Manage drippage and other related wastes to prevent release in the environment.

Drip aprons must be roofed, paved and drained to prevent dilution and loss of treatment solution.

DO NOT expose treated lumber to rains immediately after treatment.

For further information on storage, handling, and disposal of treated wood, contact the manufacturer of this product or the provincial regulatory agency.

D. For products registered for use as remedial wood preservatives:

I) The following statement must be included in a section entitled **DIRECTIONS FOR USE**:

DO NOT apply this product to wood that will be used in water.

References

A. Studies Considered in the Chemistry Assessment

LIST OF STUDIES/INFORMATION SUBMITTED BY REGISTRANT

PMRA Document Number	Reference
1402419	1994, Preliminary Analysis and Precision and Accuracy of Analytical Method used to Validate Certified Limits:, DACO: 2.13.1,2.13.3 CBI
1402421	2002, Batch Data, DACO: 2.13.3 CBI
1402424	1994, Physical and Chemical Characteristics of ACQ-C2D: Color, Physical State, Odor, Specific Gravity, pH, Oxidizing or Reducing, Explodability and Viscosity., DACO: 2.14.1,2.14.2,2.14.3,2.14.6 CBI
1402431	1995, Physical and Chemical Characteristics of ACQ-C2D: Storage Stability and Corrosion Characteristics, DACO: 3.5.10 CBI
1402435	2002, Boiling Point/Boiling Range, DACO: 2.14.5 CBI
2121210	2011, NW-100 Technical Product Chemistry, DACO: 2.0 CBI
2121212	2011, PRELIMINARY ANALYSIS OF FIVE (5) PRODUCTION BATCHES OF NW100-TECHNICAL, DACO: 2.13,2.13.1,2.13.2,2.13.3,2.13.4 CBI
2196045	2012, Product Chemistry Requirements (Revised), DACO: 2.0,2.1,2.11,2.11.1,2.11.2,2.11.4,2.12,2.12.1 CBI
2196046	2002, Physical and Chemical Characteristics of Phibro-Tech Copper MEA Carbonate, DACO: 2.14.1,2.14.14,2.14.2,2.14.3,2.14.7,2.16 CBI
2196047	2004, Product Chemistry Evaluation for Copper MEA Solution, DACO: 2.14.13,2.14.6,2.14.7,2.14.9,2.16 CBI
2196050	2012, Preliminary Analysis of NW100-Technical, DACO: 2.13,2.13.1,2.13.2,2.13.3,2.13.4 CBI
2500321	2014, Preliminary Analysis of ACQ C2 (amended), DACO: 2.13.3 CBI
2579279	2015, Batch Data - [CBI REMOVED], DACO: 2.13.3,2.13.4 CBI
2579280	2015, Analysis of Copper Solutions by Inductively Coupled Plasma Atomic Emission Spectrometry , DACO: 2.13.1 CBI
2579281	2015, Determination of [CBI REMOVED] in Copper Solution by Inductively Coupled Plasma Mass Spectrometry , DACO: 2.13.1 CBI
639316	2003, Technical Chemistry file CUL-WOA-1 - Determination Of Copper and Copper Powders Samples Analysis As Per Quotation., DACO: 2.13.2,2.13.3,2.13.4 CBI
1138048	2004, Nufarm NUP 8A 04 Copper Hydroxide Product Chemistry Volume III: Preliminary Analysis, Certified Limits and Enforcement Analytical Methods and Confidential Attachment, DACO: 2.13.1,2.13.2,2.13.3,2.13.4 CBI

1318966	2004, SCM Metal Products Cuprous Oxide, containing Cuprous Oxide. Letter to Ms. Keppel-Jones of PMRA responding to her Clarification Notice of September 9, 2004, DACO: 2.13.1,2.13.3,2.99 CBI
1432644	2007, [CBI REMOVED] Study Chem Copp HPIII, DACO: 2.13.3 CBI
1469225	Information migrated from TGAI Chemistry paper files ("Brown" Files), Red Copp 97N, Reg # 21244, CUP-AMT-2, DACO: 2.99
1469548	Response data., Received 2004-05-21, CUP-AMT-2, DACO: 2.13.3
1518023	1988, CUP-NDX-2 : Confidential Attachment to Chemistry, Part 2, Nordox Cuprous Oxide Paint Grade, DACO: 2.99
1826137	2009, Copper Hydroxide MUP: Preliminary Analysis and Enforcement Analytical Method, DACO: 2.13.1,2.13.2,2.13.3,2.13.4 CBI
2024427	2011, Copper Hydroxide MUP: Preliminary Analysis and Enforcement Analytical Method, DACO: 2.13.4,4.8 CBI
2151372	DACO: 2.13.3 CBI
2151374	DACO: 2.13.3 CBI
2155844	2012, DACO Compliation for Copper, DACO: 2.1,2.11.1,2.11.2,2.11.3,2.11.4,2.12.1,2.13.1,2.13.2,2.13.3,2.13.4,2.14.1,2.14.2,2.14.4,2.14.6,2.2,2.3,2.4,2.5,2.6,2.7,2.8,2.9 CBI
2195476	2008, TECHNICAL GRADE ACTIVE INGREDIENT COPPER (II) HYDROXIDE ANALYSIS AND CERTIFICATION OF PRODUCT INGREDIENTS IN SUPPORT OF REGISTRATION OF DUPONT COPPER (II) HYDROXIDE TECHNICAL, DACO: 2.0,2.11,2.11.1,2.11.2,2.11.3,2.11.4,2.12,2.12.1,2.13,2.13.1,2.13.2,2.13.3,2.13.4 CBI
2345649	2012, Final Report for: Preliminary Analysis of Copper Hydroxide Wet Cake, DACO: 2.13.1,2.13.2,2.13.3,2.13.4 CBI
2407016	2014, [CBI REMOVED] Analysis_14MAR2014, DACO: 2.13.4
2459533	2014, Analysis of Impurities in SCM Metal Products Cuprous Oxide, Registration NUmber 22327 PCP Act, DACO: 2.13.4 CBI
2453313	2012, 5-Batch Analysis, DACO: 2.13.3 CBI
2557858	1999, Standard Test Methods for Chemical Analysis of Cuprous Oxide and Copper Pigments, DACO: 2.13.1
2557859	2012, Determination of Complete Chemistry in Six Batches of Technical Grade Cuprous Oxide Powder, DACO: 2.13.3 CBI
2557860	2014, Case Narrative - analysis for [CBI REMOVED], DACO: 2.13.3 CBI
2453337	2012, 5-Batch Analysis, DACO: 2.13.3 CBI
2557850	1999, Standard Test Methods for Chemical Analysis of Cuprous Oxide and Copper Pigments, DACO: 2.13.1
2557851	2012, Determination of Complete Chemistry in Six Batches of Technical Grade Cuprous Oxide Powder, DACO: 2.13.3 CBI
2557852	2014, Case Narrative - analysis for [CBI REMOVED], DACO: 2.13.3 CBI

2489733	2007, Determination of Total Copper and Six Impurities in Five Batches of Cuprous Oxide Technical, DACO: 2.13.3,2.13.4 CBI
2489734	2013, 5-batch Analysis - Qualitative and Quantitative Profile of the test substance NORDOX Cuprous Oxide, DACO: 2.13.3,2.13.4 CBI
2548342	2015, Impurities of Toxicological Concern 5- batches, DACO: 2.13.3,2.13.4 CBI
2548343	2013, Revised: 5-batch Analysis - Qualitative and Quantitative Profile of the test substance NORDOX Cuprous Oxide, DACO: 2.13.3 CBI
2501783	2015, Report for the Analysis of [CBI REMOVED] in Copper Technical Products, DACO: 2.13.4 CBI

ADDITIONAL INFORMATION CONSIDERED

Published Information

1719804	Canada, 2009. Pest Management Regulatory Agency. Proposed Re-evaluation Decision PRVD2009-04, Copper Pesticides.
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